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INSECTS ON RUTACEOUS TREES NATIVE TO SUBTROPICAL AUSTRALIA

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During the year 1931, an unsuccessful attempt was made to locate the native habitat of the citrus pest, *Coccus pseudomagnoliarum Kuw.*, through a careful examination of such native Australian trees as are included in the citrus family. Available literature records these trees as hosts for five species of insects. In the course of this inspection, however, many insects of considerable interest were discovered, a number of which were new to science. The search was made in New South Wales and Queensland, between latitudes 23° and 33°, within 500 miles of the eastern coast.

The most common and widely distributed of the rutaceous trees are *Geijera parviflora* Lindl. (wilga), and *Eremocitrus glauca* Swingle (wild lime). These occur, for the most part, on the plains west of the coastal ranges; an exception is the occurrence of *Eremocitrus* on the coast in the vicinity of Rockhampton, Queensland. *Microcitrus australasica* Swingle (finger lime) and *M. australis* Swingle (dooja) are fewer in number and restricted in distribution. These occur in the coastal ranges of Queensland and northern New South Wales. *M. australasica* is found in the vicinity of the patches of coastal rain forests and *M. australis* somewhat further inland.

Saissetia hemispherica and *Coccus hesperidum* were found on the branches of *M. australis* on the Blackall Range. The leaves were attacked by a leaf-miner, which formed a circular cavity. This resulted in the formation of a yellow circular patch one-eighth inch in diameter on the leaf surface.

Pseudococcus longispinus, *Saissetia hemispherica*, and an undescribed species of *Saissetia* occurred on the finger limes on Tambourine Mountain, Queensland. A circular, flat, yellow, diaspine scale was also present. Gall insects attack the twigs, forming elongate galls about one-half inch in diameter. These are similar to the galls occurring on cultivated citrus, as described by Noble (5).

Geijera parviflora was carefully examined, particularly in the vicinity of Moree and Dubbo, New South Wales. The black, white-fringed larvæ of an aleyrodid was occasionally plentiful on the leaves. On some trees nearly every leaf was sparsely infested with an extremely small slender diaspine scale impressed on the upper surface. This scale is light yellow until maturity. Old scales are dark colored.

Isolated specimens of a species of *Paralecanium* were occasionally found on the upper surfaces of the leaves. This is an oval, perfectly flat, dark red scale, about one-tenth inch in length. The dorsum of the adult is heavily chitinized. Apparently it is viviparous. A round white diaspine scale, with a greenish center, also occurs on the leaves. On the limbs is found a dark scale, possibly *Mytilaspis wilga* Leonardi (3).

Interesting leaf galls are made by two species of thrips, *Choleothrips geijeræ* Moulton and *Dolerothrips geijeræ* Moulton (4). These produce galls by causing the edges of the leaves, which are long and narrow, to roll inward to form tubular cavities.

Eremocitrus glauca, the most abundant of the rutaceous trees, had the greatest diversity of insect fauna.

Apparently the first record of an insect attacking the native rutaceous trees was Froggatt's account (2) of the lime borer, *Citriphaga mixta* Lea. This is a beautiful longicorn beetle that oviposits in the bark a few inches above the ground. The larva works up the center of the trunk forming a large bore, often four or five feet in length. The work of the larva is followed by considerable gumming of the injured wood. The tree is thus weakened and sometimes killed. The wing covers of the adult beetle are marked with a pattern of snow-white patches of fine hairs against a background of dark brown.

The tender twigs and leaves are attacked by a weevil which is similar in life history and habit to the alfalfa weevil. Oviposition occurs in cavities excavated in the succulent twigs. The larvæ are bright yellow and are covered with slime to which particles of excreta adhere. They feed on the new plant tissue and when full grown are about one-half inch in length. Pupation occurs within a round yellow net-like cocoon. The adult is a robust gray beetle, nearly one-fourth inch in length.

A caterpillar, *Anomogenes morphnopa* Turner (7), a new

genus of the family *Œnochromidæ*, was found feeding on the leaves of the *Eremocitrus* in the vicinity of Roma, Queensland. The full-grown larva is about one inch in length and, like its host, gray-green in color. It has the appearance of a geometrid. When disturbed it straightens out and becomes rigid, with the head and legs withdrawn. It is not abundant. The eggs are deposited in groups on the leaves and are heavily parasitized.

A much smaller but more active caterpillar feeds on the bark of small limbs and twigs. It was quite abundant on *Eremocitrus* between Roma and Injune during August. An outstanding characteristic of the larva of this species is its habit of spending almost its entire larval and pupal periods within a long tough silken tube. Fine particles of yellowish frass are incorporated in the walls of this tube, which is convoluted about the twig. It increases in diameter from the point where the newly-hatched larva commenced feeding to that at which it ceased feeding. The total length may reach five or six inches. Larvæ were collected for rearing but they were destroyed by a tachinid parasite.

Another small caterpillar mines the leaves of *Eremocitrus*, causing the leaves to hang like gray paper sacks. The caterpillar is dark brown and holcocera-like in appearance. By the time the caterpillar is full grown the leaf is completely hollowed out. The leaf remains attached to the plant only because the larva had previously secured it by spinning a stout webbing about the base of the petiole and at the point of attachment to the twig. It was found in greatest abundance near Narromine, New South Wales.

A tree-hopper belonging to the Cicadelloidea (1) is one of the most generally distributed of the lime tree insects. The adult is dark gray and about one-fourth inch in length. In the vicinity of Chinchilla and Gogango, Queensland, they were found ovipositing from August to October. Oviposition occurred in parallel slots made in the bark of young twigs. Many of the eggs are parasitized. The nymphs are gregarious, congregating at the bases of the stems. According to Evans there are probably five nymphal stages, exclusive of the pronymph. The colonies are invariably attended by ants (probably Iridomyrmex) which feed on the excrement.

According to Summerville (6), the larger horned citrus bug, *Biprorulus bibax* Bred., is found in large numbers on the lime

during the summer when the trees are in fruit. It deposits pearly-white eggs on the surface of the plant. The adult is shining lemon-green in color, elongate oval, and about one inch in length. Feeding appears confined to the fruit if it is available, otherwise it probably feeds on the young tender growth.

There are a number of different gall-forming insects that attack the leaves, buds, fruits, tender twigs, and thorns. The bud gall is a single-celled capsule. The thorn galls contain several cells. Single-celled galls are formed of the ovaries within the fruits. Botanists have had difficulty in collecting the seeds of *Eremocitrus*, since most of them are destroyed by these insects (probably Eurytomids).

The galls in the tender twigs apparently are caused by a Cecidomyid. Red larvæ were observed within the galls.

Two undetermined species of aleyrodids attack *Eremocitrus*. The larva of the most common species is jet-black, fringed with short white filaments. Occasionally it becomes abundant enough to kill small plants. Heavy infestations were noted near Goondiwindi and Gogango. The adult is orange-yellow with white wings marked with three large yellow spots.

The second species is less common. More than four or five specimens on a single plant were rarely found. The larva is yellow, without wax filaments, and considerably larger than the preceding series. It is probably a species of *Bemesia*. It was found most readily near Surat.

Many species of coccids find the leaves of *Eremocitrus* to be a suitable host. These are:

Family Dactylopiidæ. Subfamily Asterolecaniinæ.

Cerococcus stellatus (Mask.) collected at Mootwingee, Trangie, Moree, New South Wales, and Chinchilla, Queensland, is usually found in the leaf axils or crevices in the bark. The wedge-shaped female is covered with a thick, waxy, brown secretion, 1 mm. to 2 mm. in diameter. It is rarely abundant although common.

Lecaniodiaspis atherospermæ (Mask.) is common on the branches of *Eremocitrus* from Trangie to Gogango. It was abundant enough near Meandarra, Queensland, to kill the plants. The immature stages are dark green, flat, and oval in outline. When mature they completely enclose themselves in a light tan-colored smooth hemispherical ovisac, about one-eighth inch in diameter. Oviposition occurs in August and September. The eggs are green.

It is apparently single-brooded.

Asterolecanium transversum Mask., collected at Mootwingee, New South Wales, and Gogango, Queensland, attacks the branches of *Eremocitrus*. Several plants were found to be heavily infested near Emerald, Queensland. The test of this insect is lemon-yellow, pear-shaped, and about two mm. in diameter.

Family Margarodidæ. Subfamily Monophlebinæ.

Monophlebulus crawfordi Ckll. is rarely found on *Eremocitrus*. Three specimens were collected near Surat, Queensland.

Family Coccidæ.

Ceroplastes rubens Mask., one of the worst pests of citrus in the humid regions of Australia, was found to be plentiful on *Eremocitrus* at Marmor.

Coccus hesperidum Linn. was observed near Chinchilla and Marmor, Queensland. It is rarely abundant and there is confined to a small portion of the tree. Only in two instances was it found abundant enough to result in the smutting of the foliage.

Coccus elongatus (Sign.) occurred on *Eremocitrus* at Marmor and Gogango, Queensland. It was not abundant and apparently requires a humid climate.

Coccus bicruciatum (Green) was found infesting the bumble tree, *Capparis mitchelli*, near Chinchilla. One specimen, however, was found on *Eremocitrus* at Blackwater, Queensland. When nearly mature it is yellowish-green, flat, oval, and about three-sixteenths inch in diameter.

Saissetia nigra (Niet.) occurred in numbers on several stunted plants at Gogango.

Saissetia hemispherica (Targ.) lightly infested the *Eremocitrus* at Marmor.

Saissetia oleæ (Bernard) was occasionally abundant on small plants. It was found at Chinchilla and Goowarra, Queensland. At Gogango several plants were found to have been killed by a heavy infestation of this scale. The chalcid *Scutellista* and the scale-feeding noctuid *Catoblemma dubia* Butl. were the only insect enemies of the scale observed.

At least eight species of diaspine scales were found on the *Eremocitrus*. The identification of the collected material has not yet been received.

One reddish-brown species (probably a mytilaspid) was found to be particularly destructive, attacking both leaves and

twigs. At Moree and Cornwall Station, Queensland, a large number of stunted plants were heavily infested. This infestation, combined with the effects of drouth conditions, had apparently killed many plants.

A round white scale (probably *Aspidiotus* sp.) was sometimes plentiful on the leaves, but no injury was observed.

A round, flat, chocolate-colored scale was found lightly infesting the leaves of lime in the vicinity of Blackwater. The scale covering measured 2¼ mm. in diameter. It was the largest of the armored scales on lime.

A white cigar-shaped scale was found at Marmor. It had the peculiar habit of settling only on the edges of the leaves. The effect of this was to give the leaf a serrated appearance. In this locality the stems of the lime were infested with a yellowish-gray scale. It was very long, narrow, and serpentine in shape.

Several specimens of what appeared to be *Chrysomphalus citrinus* were also collected from the line at Marmor. One specimen of *Comperiella bifasciata* was reared from this material.

Through the cooperation of Messrs. Lea, Evans, Turner, and Steinweden, it has been possible the indicate the names of some of the new species obtained. Mr. Steinweden also identified the unarmored coccids.

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NOTES ON SOME TETTIGONIINAE OF CALIFORNIA WITH DESCRIPTIONS OF NEW SPECIES

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Recently there were received for determination several species of Tettigoniinæ from F. H. Wymore of the College of Agriculture of the University of California at Davis, California, and one from Mr. W. B. Cartwright of Sacramento, California.

In the collection of material received from Mr. Wymore was an adult female found in a nursery at Davis, California, September 15, 1932. This has been determined as *Capnobotes bruneri* Scudder, and a discussion of this follows:

CAPNOBOTES BRUNERI Scudder

This specimen of *bruneri* now deposited in the National Museum is apparently the second individual of this species known. It is somewhat more slender than the type specimen, and the tegmina are less uniformly brownish. The following measurements were made:

Length of pronotum 7 mm., of tegmina 50 mm., of posterior femora 30 mm., of ovipositor 33 mm.; width of pronotum posteriorly 5 mm., of tegmina at the widest part 8.5 mm., near the tip 4 mm.

The last dorsal segment of the abdomen above the triangular supra-anal plate is not so deeply cleft apically, and for that reason does not form such attenuated prolongations as in *C. fuliginosus* Thomas. In this respect it resembles *C. occidentalis* Thomas as represented by two females in the National Collection. (See figs. 1 and 2.)

In order to facilitate the determination of the species of the genus *Capnobotes* as now recognized, the following key has been made to separate the females:

A. Last dorsal segment of the abdomen apically deeply divided, the angles forming attenuated prolongations extending over the supra-anal plate, almost or quite reaching the tip (fig. 1); under wings rather uniformly and deeply fuliginous..... .....*fuliginosus* Thomas

*The figures illustrating this paper were drawn by H. A. Allard.

A. Last dorsal segment of the abdomen less deeply divided apically, the angles forming prolongations scarcely exceeding the middle of the supra-anal plate (fig. 2); under wings generally less fuliginous in the posterior field.
  B. Tegmina near apex distinctly more than one-half as broad as their greatest width.
    C. General color brown or faun....*occidentalis* Thomas
    C. General color green or greenish
      D. Tegmina uniformly greenish.....
      .....*occidentalis* var. *uniformis* Caudell
      D. Tegmina greenish with a longitudinal row of light-colored discal spots.....
      ..... *occidentalis* var. *viridis* Cockerell.
  B. Tegmina near apex no more than one-half as broad as their greatest width.....*bruneri* Scudder

Idionotus similis Caudell, n. sp.

Specimens of a species of *Idionotus* received from Mr. Wymore very closely resemble superficially *I. brunneus* of Scudder, but are at once distinguishable from that species by the very distinctive cerci of the male, and the name *similis* has been given to it. A description follows:

Head scarcely as broad as pronotum. Vertex about one-half as broad as interocular space. Eyes black, moderately prominent, subequal in width to that of vertex. Basal segment of antenna about two thirds as broad as vertex.

Lateral lobes of thorax well developed and moderately declivate. Lateral carinæ distinct, rather sharp for their entire length, and bowed distinctly inwards at about the anterior third. Median carina distinct on a little more than the posterior fourth of pronotum. Anterior margin of pronotal disk moderately concave; posterior margin truncate. Prosternum wholly unarmed. Legs long and slender; fore tibiæ armed above on the outer margin with three or four spines. Hind femora over three times as long as pronotum and strongly swollen basally. Hind tibiæ with four apico-ventral spurs.

Tegmina of male strongly abbreviated, broadly overlapping, and projecting from beneath the pronotal disk a distance equal to about two-thirds the posterior width of pronotum. Tegmina of female barely overlapping, and projecting from beneath the pronotum to a much less degree. Under wings abortive in both sexes.

Abdomen rather plump, the last dorsal segment transverse in both sexes, in the male very broadly and roundly concave. Supra-anal plate triangular and dorsally broadly sulcate in both sexes,

in the female so closely fused with the last dorsal segment of the abdomen as to make the connecting suture very obscure, or almost obliterated (fig. 3). In the male the connecting suture is very distinct (fig. 4). Subgenital plate broad, apically shallowly notched in both sexes, in the female furnished with a pair of unsegmented apical styles three or four times as long as basally broad, tapering, the apical third rather abruptly so (fig. 3). Cerci of male short and stout, curved gently inwards, scarcely more than twice as long as the middle width, slightly flattened with the sides subparallel, apex broadly notched, inner angle somewhat more produced and slightly thicker than the outer (fig. 4). Ovipositor noticeably shorter than the posterior femora and curved very gently upward. General coloration light yellowish brown with the legs generally tending toward a darker color except the base of the femora.

Length of body from front of head to tip of abdomen, male 22 mm., female 23 mm.; length of pronotum, male 6.5 mm., female 6.75 mm.; length of tegmina beyond pronotal disk, male 2.5 mm., female 1.5 mm.; posterior femora, male 20 mm., female 23 mm.; length of ovipositor 19 mm.; width of pronotal disk posteriorly, male 4 mm., female 4.25 mm.; width of ovipositor at middle 1.5 mm.

Described from four males and one female, all adults, taken at Caribou, on the Feather River, California, July 6, 1932, by Mr. F. H. Wymore.

Holotype male, allotype female, and one male paratype in the United States National Museum, Catalogue No. 44901. The other two paratypes, males, are in the collections of the University of California.

Three specimens, two males and one female, which have been identified as a hitherto unrecognized variety of *Idiostatus inermis* Scudder, were also sent by Mr. Wymore. A description of it follows:

Idiostatus inermis major, Caudell, n. var.

Length of body from head to tip of abdomen, male 27 mm., female 26 mm.; length of pronotum, male 7 mm., female 6.5 mm.; length of tegmina beyond pronotal disk, male 4 mm., female 2.5 mm.; length of posterior femora, male 21 mm., female 23 mm.; length of ovipositor 26 mm.

Apical teeth of cerci of male (fig. 5), especially the submedian tooth, much more elongate in typical *inermis* (fig. 6).

Described from three specimens collected at Doyle, Lassen

County, California, July 1930. The holotype, male, and allotype, female, are deposited in the U. S. National Museum, Catalogue No. 44907. The paratype male, which was slightly smaller than the holotype, was returned to Mr. Wymore.

Since the publication of the author's revision of the Decticinæ[1], a quarter of a century ago, material of *I. inermis* has come to hand from Nevada, northern California, and Oregon. Although the species is now known to be variable in size, the usual dimensions are about as given in the author's original description. Specimens from Chester, California, examined by the writer are very small, with the following measurements:

Length of body from front of head to tip of abdomen, male 19 mm., female 16 mm.; length of pronotum, male 4.5 mm., female 5 mm.; length of posterior femora, male 13 mm., female 16 mm.; length of ovipositor 17 mm. Except for their small size these agree very well with typical *inermis*, and they are determined with little doubt as that species.

The unusually large specimens received from Mr. Wymore, on the other hand, represent the other extreme, and their large size together with the strikingly different cerci of the male as compared with those of *inermis* seem to warrant the varietal name *major* above proposed.

The material received from Mr. W. B. Cartwright of Sacramento, California, has proven to be an undescribed species belonging to the genus *Idiostatus*. In the author's key to the previously known species of this genus the male of the new species runs out to *fuscopunctatus* Scudder, but the cerci are differently shaped; the female runs to *inermis* Scudder. This new species is not, however, closely allied to either of these. It is described as follows:

Idiostatus fuscus Caudell, n. sp.

Head inserted into the pronotum almost to the eyes, the cheeks swollen to a width slightly greater than that of the pronotum behind them. Eyes moderately prominent. Fastigium of the vertex about two-thirds as broad as the interocular space. Antennæ when directed backwards extending beyond the middle of abdomen.

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[1] Proc. U. S. Nat. Museum, Vol. XXXII, p. 386 (1907).

Pronotum with the lateral lobes well developed and moderately declivate. Anterior margin of pronotal disk very broadly rounded, the posterior margin truncate. Median carina of pronotum distinct only on the posterior third and not at all conspicuous even there. Lateral carinæ of pronotum not indicated on the anterior two thirds represented posteriorly by rounded shoulders. Prosternum unarmed.

Legs short, the posterior femora about three times as long as the pronotum in male, less in female, and rather strongly swollen basally. Anterior tibiæ with three dorsal spines on the outer margin. Posterior tibiæ with four apical spurs, ventral pair equal in length, lateral pair unequal the outer spur about twice as long and the inner almost three times as long as one of the ventral ones. Free plantulæ of hind tarsi well developed, about two fifths as long as the basal segment. Tegmina present in both sexes, in the male overlapping and projecting from beneath the pronotal disk a distance equal to about one-half the pronotal length, in the female forming widely separated lateral pads projecting very slightly beyond the pronotal disk.

Abdomen moderately plump, dorsally very slightly keeled. Last dorsal segment transverse and apically notched, much more broadly so in the male. Supra-anal plate of both sexes triangular, in the male more acute apically and strongly deflexed. Subgenital plate of male very noticeably longer than broad, apically triangularly notched and bearing a pair of apical styles about four times as long as broad; subgenital plate of female not or barely longer than broad and notched apically as in the male. Cerci of male a little more than three times as long as basally broad, armed about the middle with a stout tooth, apically slightly curved, and having the inner side from the tooth to the tip moderately convex (fig. 8). Cerci of female simple, about three times as long as the basal width and tapering rather uniformly to the tip. Ovipositor somewhat longer than the posterior femora, rather slender, very gently upcurved, and apically sharply pointed.

General color dark reddish brown, darker than the usual color for species of this genus. Sides of pronotum and abdomen apically, except beneath, blackish, the former usually narrowly margined below with yellowish. Face, ventral surface of body and femora, more especially the posterior pair, lighter in color. Tegmina of the male slightly lighter than the rest of the dorsal coloration, without apical spots. Ovipositor yellowish.

Length of body from front of head to tip of abdomen, male 17 mm., female 22 mm.; length of pronotum, male and female, 5.5 mm.; length of tegmina beyond pronotal disk, male 3.3 mm., female 1 mm.; length of posterior femora, male 13 mm., female 16 mm.; length of ovipositor 19 mm. Width of pronotum posteriorly, male and female, 4.5 mm.; width of posterior femora at broadest point,

male and female, 3 mm.; width of ovipositor at middle 1.3 mm.

Described from three male and three female adults, and one female nymph, all labeled "Ralston Peak, California," and taken by C. C. Wilson, October 13, 1932.

Holotype male and allotype female, two paratypes, male and female, and the nymph, in the United States National Museum, Catalogue No. 44902. The other two paratypes, male and female, were returned to Mr. Cartwright.

Idiostatus wymorei, Caudell, n. sp.

Allied to *Idiostatus fuscus* Caudell and in a key to species falls next to that insect, from which it seems amply distinct, especially in the genital characters of the male.

Head well inserted into the pronotum, the cheeks very slightly swollen; eyes slightly smaller but somewhat more prominent than in *fuscus;* interocular space and antennæ as described under *fuscus*. Legs about as in that species except the free plantula of the posterior tarsus averages somewhat shorter than in *fuscus* and the hind femora are relatively longer, being at least two and one half times as long as the pronotal disk. Tegmina and abdomen about as in *fuscus* but the last dorsal segment of the abdomen of the male seems to be usually less broadly concave and the cerci of the male are quite different; the inner tooth of this organ, as shown by the accompanying figure, is placed much beyond the middle of the cercus, while in *fuscus* it is situated about the middle; the inner surface of the tip of the cercus beyond the tooth is scarcely at all convex, thus differing noticeably from that of *fuscus*. The ovipositor is rigidly straight, not at all curved upwards, and is noticeably longer than the posterior femora.

General color almost uniformly light yellowish brown with a tinge of greenish on the posterior third of the pronotal disk; the tip of the abdomen and apex of the tegmina of the male unicolorous with the rest of the body.

Length of body from head to tip of abdomen, male 20 mm., female 21 mm.; pronotal disk, male and female, 6 mm.; tegmina beyond pronotal disk, male 4.5 mm., female 0.5 mm.; posterior femora, male 16 mm., female 17 mm.; ovipositor, 22 mm. Width of pronotum posteriorly, male and female, 4.5 mm.; posterior femora at widest point of both sexes, 3 mm.; ovipositor at middle, 1.3 mm.

The coloration varies rather decidedly in the series of specimens examined, ranging from that of the holotype and allotype described above to a blackish brown; the females seem more prone to exhibit this darker coloration. The posterior third of the pronotal

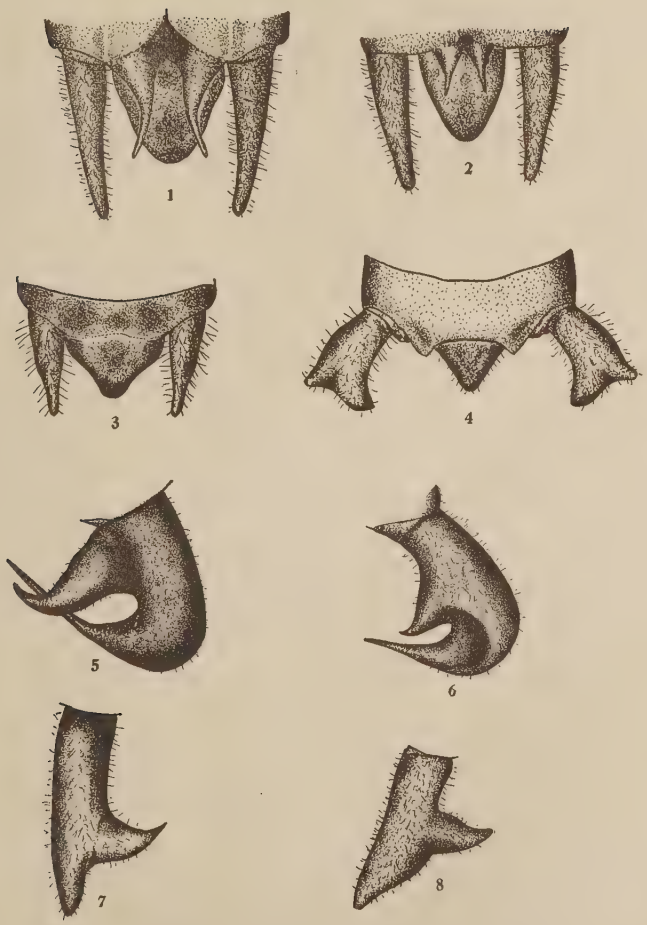

Fig. I. *Capnobotes fuliginosus* Thomas, tip of abdomen of female from above; Fig. II. *Capnobotes bruneri* Scudder, tip of abdomen of female from above; Fig. III. *Idionotus similis* n. sp., tip of abdomen of female from above; Fig. IV. *Idionotus similis* n. sp., tip of abdomen of male from above; Fig. V. *Idiostatus inermis* var. *major*, n. var., dorsal view of cercus of male; Fig. VI *Idiostatus inermis* Scudder, dorsal view of cercus of male; Fig. VII. *Idiostatus wymorei* n. sp., dorsal view of cercus of male; Fig. VIII. *Idiostatus fuscus* n. sp., cercus of male.

disk may be as noted in the above description or almost or quite unicolorous with the rest of the pronotum. The general coloration occasionally assumes a faint mottled appearance. In size and structure there is but little noticeable variation in either sex.

Described from thirteen males and thirteen females taken at Strawberry, El Dorado Co., California, on September 14, 1934 by F. H. Wymore.

Holotype male and allotype female and nine paratypes, five males and four females, in the United States National Museum. Catalogue No. 50739. The other paratypes, seven males and eight females, were returned to Mr. Wymore.

This species was at first thought to possibly be the *Idiostatus fuscopunctatus* of Scudder, an idea abandoned when the differently shaped cercus and the apically black-marked tegmina of the male of the latter species were considered. It has been christened in honor of its collector.

Neduba diabolicus Scudder

The insect described by Rehn and Hebard as *Aglaothorax sierranus* should, in the author's opinion, be transferred to the genus *Neduba*. Mr. Hebard has informed him that recent studies have shown this to be a synonym of Scudder's *Tropizaspis diabolicus*, both these specific names being referable to the genus *Neduba*.

Note on the Liebeck Collection

We have heard that the collection of Mr. Charles Liebeck has been deeded to Dr. H. C. Fall. This is one of the first class private collections in the country, assembled through a period of many years and containing many specimens received from Dr. George Horn and from most of the other well known coleopterists of the country, as well as great numbers collected by Mr. Liebeck himself from the environs of Philadelphia. Though much desirable material in certain groups had already been distributed before Mr. Liebeck decided to part with his collection, what remains will serve to greatly augment the already most valuable collection of Dr. Fall.—E. C. Van Dyke.

A COLLECTION OF TERMITES FROM ARIZONA

BY S. F. LIGHT

The termites here reported were collected by Dr. Wolfgang von Hagen during the spring of 1933 in the vicinity of Tucson, Arizona and in the Ajo Valley, Arizona. No alates were present but late instar reproductive nymphs were present in several collections. Determinations therefore were based on soldiers.

Reticulitermes humilis Banks

A single collection from the vicinity of Tucson.

Heterotermes aureus Snyder

Two collections from the Ajo Valley and one from near Tucson.

Nasutitermes (Tenuirostritermes) cinereus (Buckley)

Three collections from the Sonoran plateau in extreme south central Arizona near the Mexican border. This species has been known heretofore only from Texas (Banks and Snyder 1920) while the Arizona species has been determined as *N. (T.) tenuirostritermes* Desneux. These nasutes agree perfectly with those in my collection taken by Babcock in Sonora, Texas, and with the available descriptions of *N. cinereus*.

It has seemed worth while to give a brief description of these nasutes in view of the meagerness of existing descriptions.

Color: Tergites and nota smoky brown; sternites and coxæ pale smoky; legs (beyond coxæ) and palpi pale yellow to white; antennæ smoky yellow in basal half becoming lighter distally; head smoky mahogany; rostrum black in basal three-quarters, with pale tip.

Head of three regions, approximately equal in length, an uplifted region posterior to the constriction, a middle region extending from the constriction to the base of the rostrum and finally the rostrum. Dorsal profile faintly convex between constriction and base of rostrum. Rostrum slightly uplifted, narrow, only slightly enlarged near its base, decreasing very slightly in thickness to near tip where abruptly narrowed to minute hyaline tip. Middle portion of head widest at its anterior end where nearly three-quarters as wide as posterior end. Antennæ of 12 or 13 segments.

Measurements in millimeters of nasute of *N. (T.) cinereus* (Buckley) from southern Arizona: Length with head extended, 3.30;

length of head with rostrum, 1.44; length of head without rostrum, 0.96; length of rostrum, 0.48; length of head between constriction and base of rostrum, 0.45; length of head posterior to constriction, 0.51; maximum width of head, 0.69; width of head at constriction, 0.48; maximum width of head in front of constriction, 0.55; width of rostrum at center, 0.08.

AMITERMES (AMITERMES) MINIMUS Light
(=*A. wheeleri* of Banks and Snyder 1920)

Two collections from the Ajo Valley.

AMITERMES (AMITERMES) WHEELERI (Desneux)
(=*A. californicus* Banks and Snyder 1920)

Two collections from the Ajo Valley and one from Tucson. These are all of the smaller type with lighter, more slender mandibles and teeth, a type which may prove to be distinct from the larger, darker type found in California.

AMITERMES (GNATHAMITERMES) PERPLEXUS Banks

Twelve collections from the Ajo Valley and the vicinity of Tucson show this to be the prevalent species of the subgenus in this region. Most of the soldiers agree fairly closely with my characterization of the soldier of this species (1932).

Three very aberrant soldiers led me to believe at first that I was dealing with a separate and new species. Indeed, had they not been taken with soldiers and workers of *A. perplexus* they would almost certainly have been so treated by any systematist. A description follows. The remarkable uniformity in character of these three soldiers from as many colonies raises the question as to their status in the caste system. Two theories suggest themselves. That they represent a small soldier caste such as occurs in other genera or that they represent some regularly occurring intercaste, such as the fertile soldiers found in *Zootermopsis*.

Description of aberrant soldier of *A.* (*G.*) *perplexus*:
Similar to normal soldiers in head and body characters but smaller in all proportions. Mandibles very slender, without teeth, lateral margin concave, inbent below and outbent beyond level at which teeth would ordinarily occur.

Measurements of aberrant soldier of *A.* (*G.*)*perplexus*:
Length of head, 1.08; width of head, 1.02; length of left mandible, 1.17; minimum mandible curvature, 0.03; mandible curvature index, 0.025; head index, 0.95; head mandible index, 0.92.

MOSQUITO RECORDS FROM UTAH

BY DON M. REES
University of Utah

The following records of the mosquitoes of Utah are presented as a preliminary list from specimens now in the collection of the University of Utah. The records and species here listed are incomplete for the state and will be supplemented as further collections are made.

The species listed are the more common mosquitoes of this section and in most instances are represented in the collection by numerous specimens. Most of the species were identified from adult male genitalia, and larvæ. A few were identified from specimens of adult females but all such identifications were checked by Dr. Alan Stone of the United States Bureau of Entomology.

AEDES VEXANS Meigen

This species has been taken in the valleys through the central and northern part of the state, from May to October. Several broods occur during the season breeding in warm shallow ground pools created by rain or irrigation water. They are very numerous at times and the females bite readily, particularly at dusk and in the early morning.

Utah: Salt Lake City, May to October, 1929 to 1932 (Rees); Bear Lake, August 11, 1929 (Rees); Logan, June to August, 1930 (J. S. Stanford); Springville, June 15, 1930 (Rees); Richfield, July to September, 1930 (light trap); Mill Creek, May to October, 1930 to 1932 (Rees); Wales, August 23, 1931 (Rees); Nephi, August 23, 1931 (Rees); Ogden, July 29, 1932 (Rees); Provo, August 12, 1932 (Rees).

AEDES DORSALIS Meigen

Aedes dorsalis Meigen is the most common pest mosquito in the valleys and deserts of Utah. It is state wide in distribution, breeding in open ground pools, particularly in salt grass flats flooded with rain or irrigation water. A new brood appears after each flooding. The first brood appears just as the snow melts in the spring and successive broods are found until late in the fall. The adult females will bite any time but are more active at dusk. They sometimes migrate considerable distances from their breeding areas.

Utah: Salt Lake City, June, 1914; Corinne, September 9, 1925; Ogden, October 18, 1928 (W. H. W. Komp); Holiday, October 22, 1928 (Rees); Riverton, October 25, 1928 (Rees); Murray, October 25, 1928 (Rees); Salt Lake City and vicinity, March to October, 1928 to 1932 (Rees); Bear Lake, June 1, 1929 (Gertsch); Wales, June 6, 1929 (Rees); Salina, July 7, 1929 (J. S. Stanford); Logan, June to August, 1930 (J. S. Stanford); Echo, July 5, 1930 (Rees); Richfield, July to September, 1930 (light trap); Wendover, November 1, 1930 (Rees); Salt Springs, November 1, 1930 (Rees); Provo, June 21, 1931 (Rees); Springville, June 21, 1931 (Rees); Spanish Fork, June 21, 1931 (Rees); Payson, June 21, 1931 (Rees); Promontory Point, June 25, 1932 (Newby); Black Rock, August 2, 1932 (Rees); Ferron, August 27, 1932 (Rasmussen); Locomotive Springs, September 9, 1932 (Rees).

Aedes campestris Dyar and Knab

This species has been collected in the central and northern part of the state in the same localities as *Aedes dorsalis* Meigen. The larvæ are found only in the spring but some adults remain throughout the season. They feed at any time but are more active at dusk.

Utah: Salt Lake City, October 10, 1928 (J. A. LePrince); Salt Lake City and vicinity, May to September, 1929 to 1932 (Rees); Wales, May 19, 1929 (Rees); Salina, July 9, 1929 (J. S. Stanford); Corrine, July 7, 1930 (J. S. Stanford); Richfield, July to September, 1930 (light trap); Logan, August 27, 1930 (J. S. Stanford); Salt Springs, November 1, 1930 (Rees); Locomotive Springs, September 9, 1932 (Rees).

Aedes niphadopsis Dyer and Knab

This species has been previously reported only in the vicinity of Salt Lake City. Bear Lake is 127 miles northeast of Salt Lake City and Wales 115 miles south. Undoubtedly further collections will show a much wider distribution. The larvæ appear early in the spring in small ground pools filled by melting snow and spring rains. They occur in great numbers on bench lands along the foot-hills in the spring but are all gone by early summer. The adult females bite freely during the daytime.

Utah: Salt Lake City and vicinity, April to June, 1929 to 1932 (Rees); Bear Lake, June 11, 1929 (Rees); Wales, April to June, 1930 to 1932 (Rees).

AEDES COMMUNIS De Geer

This species has been found only in woodlands in high mountain regions in the north-eastern part of the state. Further collections will undoubtedly show a wider distribution.

Utah: Beaver Creek at Lone Tree, July 6, 1929 (Rees); Kamas, June 15, 1930 (Rees); Smith Fork, July 6, 1930 (Rees); Smith and Moorehouse, June 15, 1930 (Rees).

AEDES CATAPHYLLA Dyar

This species was taken in a high mountain meadow in a heavily wooded area. They were breeding in great numbers in pools formed along the creek by overflow.

Utah: Smith and Moorehouse, May 16, 1931 (Rees).

AEDES PUNCTOR Kirby

Collected in the wooded mountain regions in the north eastern part of the state. They develop in early spring, usually in pools containing decaying organic matter. They remain in the shelter of the woods and bite during the day or at dusk.

Utah: Beaver Creek, July 6, 1929 (Rees); Granddaddy Lakes, August 3, 1929 (Gertsch); Kamas, June 15, 1930 (Rees); Smith Fork, July 6, 1930 (Rees); Heber City, July 9, 1932 (Rees); Tryol Lake, August 14, 1932 (Rees).

AEDES STIMULANS Walker

Aedes stimulans Walker is very prevalent and troublesome throughout the central and northern part of the state. It is typically a woodland species and does not occur in the desert areas. One brood a year is produced, the larvæ developing early in the spring but in high mountain regions not until June or July. Some adults survive until late in September.

Utah: Chalk Creek, June 22, 1929 (Rees); Beaver Creek, July 6, 1929 (Rees); Granddaddy Lakes, August 3, 1929 (Gertch); Parley's Canyon, June 24, 1930 (Randle); Smith Fork, July 6, 1930 (Rees); Salt Lake City, May 17, 1931 (Randle); Smith and Moorehouse, May 16, 1931 (Rees); Logan, July 9, 1931 (J. S. Stanford); Heber City, July 9, 1932 (Rees); Aspen Grove, July 10, 1932 (Rees); Mountain Dell Reservoir, September 17, 1932 (Randle).

AEDES EXCRUCIANS Walker

Found in the same localities as *Aedes stimulans* Walker. Their development and habits are similar to *Aedes stimulans* Walker, but they are not so numerous or troublsome.

Utah: Granddaddy Lake, August 3, 1929 (Gertsch); Smith Fork, July 6, 1930 (Rees); Salt Lake City, May 11, 1931 (Rees); Ferron, August 27, 1932 (Rasmussen).

AEDES FLAVESCENS Müller

Not common but seems to be more numerous in the northern part of the state.

Utah: Bear Lake, June 1, 1929 (Gertsch); Salt Lake City, June, 1930 (Rees).

AEDES FITCHII Felt and Young

This record is from a high mountain lake in the central part of the state. Further collections will undoubtedly show a wider distribution.

Utah: Fish Lake, August 20, 1929 (Rees).

AEDES NIGROMACULIS Ludlow

Perhaps state wide in distribution. Not very abundant or troublesome.

Utah: Salt Lake City, June 13, 1930 (Rees); Logan, August 27, 1930 (J. S. Stanford); Richfield, July to September, 1930 (light trap).

THEOBALDIA INORNATA Williston

This species is state wide in distribution and can readily be collected throughout the year. The larvæ appear in May and continue until November, when they have been taken frozen in ice. They breed in many different kinds of pools in great numbers. The adult females are not troublesome but will occasionally bite at dusk.

Utah: Salt Lake City and vicinity, May to November in the field and November to May in buildings, 1929 to 1932 (Rees); Bear Lake, August 11, 1929 (Rees); Black Rock, September 2, 1929 (Rees); Logan, June to September, 1930 (J. S. Stanford); Richfield, July to September, 1930 (light trap); Zion National Park, September 6, 1930 (Rees); Springville, July 7, 1931 (Rees); Nephi, August 23, 1931 (Rees); Promontory Point, May 25, 1932 (Davis); Hanna, July 24, 1932 (Rees).

THEOBALDIA INCIDENS Thomson

Collected through central and northern part of the state. The larvæ are usually found in clear, cold spring pools. Adults never very numerous.

Utah: Salt Lake City, May to September, 1929 to 1932 (Rees); Bountiful, May 27, 1930 (Stafford); Kamas, June 15, 1930 (Rees); Logan, June to September, 1930 (J. S. Stanford); Nephi, August 23, 1931 (Rees).

THEOBALDIA IMPATIENS Walker

In high mountain woodlands. Biting very viciously just at dusk.

Utah: Smith and Moorehouse, May 16, 1931 (Rees); Aspen Grove, July 10, 1932 (Rees).

CULEX TARSALIS Coquillett

In the valleys throughout the state, usually in the vicinity of human habitations. Breeding in greater numbers late in the season. The adult females are more troublesome late in the evening.

Utah: Salt Lake City and vicinity, May to October in the field and occasionally in hibernation during the winter, 1929 to 1932 (Rees); Bear Lake, August 11, 1929 (Rees); Garfield, November 5, 1929 (Rees); Logan, June to October, 1930 (J. S. Stanford); Richfield, July to September, 1930 (light trap); Zion National Park, September 6, 1930 (Rees).

ANOPHELES MACULIPENNIS Meigen

Anopheles maculipennis Meigen is found throughout the state in great numbers where breeding conditions are favorable. They have not as yet been taken at an elevation above 7,500 ft. Breeding is more abundant in late summer and early autumn. The females attack man quite readily at evening and at night.

Utah: Utah County, September 9, 1910, July 10, 1914. Salt Lake City, October 2, 1928 (J. A. LePrince); Holiday, October 17, 1928 (W. H. W. Komp); Murray, October 25, 1928 (Rees); Salt Lake City and vicinity, May to November in the field and November to May in hibernation, 1929 to 1932 (Rees); Bear Lake, August 11, 1929 (Rees); Logan, July to December, 1930 (J. S. Stanford); Zion National Park, September 6, 1930 (Rees); Ibipah, November 2, 1930 (Rees).

NEW CALIFORNIA CICADAS

BY F. H. WYMORE
U. C. College of Agriculture, Davis, California

Okanagana arboraria Wymore, n. sp.

Medium size, shiny black above, marked with orange,[1] mostly orange beneath. Length 23 mm.; expanse of forewings 64 mm. width 10 mm.

Holotype: *Head* black, 7 mm. across eyes, not quite so broad as the front margin of the pronotum; front black, moderately produced, median sulcus well defined; tinged with orange; supra-antennal plates and epicranial sutures orange; antennæ black; rostrum black, orange at base.

Thorax opaque black above marked with orange; orange beneath spotted with black. Pronotum black, margined all around with orange except small space on front margin just back of eye, immediately behind which is an orange colored patch; humeral angles rounded, anterior angles well defined, lateral margins smooth except shallow notch near center. Mesonotum narrowly margined with orange; wings with veins orange, becoming slightly darkened about the marginal cells; basal cell clear except tinge of orange along anterior border; membranes at base of both pairs of wings brilliant orange;[2] legs pale orange with black spots about knees.

Abdomen with tergum shiny bluish black, tergites narrowly margined with orange and with a slight golden pubescence; uncus black 2.5 mm. long, when viewed in profile with lower margin almost straight; from dorsal view greatly broadened in middle and slightly notched at tip; ædeagus with main trunk heavily chitinized, lateral lobes and verga thinly chitinized and straw color, viewed from above adeagus deeply grooved between lateral lobes; verga broadly lobed just back of lateral lobes tapering distally to sharp point. Below orange except a black patch on anterior margin of first abdominal segment and a black dot on outer margin of third and fourth segments; last ventral segment with sides slightly curved toward apex, feebly notched; valve orange, 5 mm. long, 1.75 mm. broad at widest point.

Allotype the same as type except the expanse of forewing

[1] "Orange rufous" of Ridgway's Color Standards and Nomenclature, Pl. II, series i.
[2] Between "Flame scarlet" and "orange chrome," Ridgway, Pl. II.

is 66 mm. Last ventral segment broadly double-notched.

Holotype, male (No. 3903), allotype, female (No. 3904, C.A.S. Ent.), and fifty-nine paratypes, two ♀ and 57 ♂ were examined. These were collected primarily along the lower end of the Sacramento River in Sacramento County, July-September, 1923-1928, as follows: thirty-nine near Courtland; fifteen on Brannon Island, near Rio Vista; one on Sherman Island, just below Brannon Island; one at Freeport. In Yolo County, three at Davis and one at Woodland. All were collected by the writer except one male specimen at Davis presented by A. S. Harrison, August 20, 1932, and a female from Salida and a male from Long Barn, presented by R. L. Usinger in 1932.

The members of this species may vary in color from shiny black marked with orange to a uniform orange rufous (variety **crocea** n. var. type male, No. 3905, C.A.S. Ent. with only a few tiny blotches of black along the lateral margin of the tergites. The black specimens seem to predominate, however, and the various intermediate stages were found. Similar color variations of *O. triangulata* Davis may also be found among specimens taken about Suisun Bay area with which species *arboraria* was confused for several years. It is, however, considerably larger than *triangulata.*

Okanagana albibasalis Wymore, n. sp.

Medium size, mostly black marked with brown,[3] fading out to a clay[4] color on the margins of the segments and appendages. Length 26 mm.; expanse of fore wings 66 m..

Holotype: *Head* black 8 mm. across eyes, not quite so broad as front margin of pronotum; front moderately produced, margined with clay color at base, median sulcus well defined, antennæ black, rostrum black clay color at base, supra-antennal plates marked with clay color.

Thorax opaque black, clothed with moderately long white hairs beneath, edges of sclerites and portions of appendages clay color. Pronotum with posterior and lateral margins and a median and three lateral marks brown; humeral angles rounded, anterior angles well defined; lateral margins only shallowly notched. Mesonotum black, the posterior margin, the elevated

[3] Hazel of Ridgway's, Pl. IV, ser. k.
[4] Clay color of Ridgway's, Pl. V, ser. b.

X, and four small anterior spots and a small spot at base of fore wings clay color; fore wings 11 mm. broad, veins mostly brown with black blotches, costal vein clay color, basal cell clear except anterior border tinged with brown; membranes at base of both pairs of wings white; legs black marked with clay color.

Abdomen with tergum shiny black with sparce white pubescence, area about tympana marked with brown; uncus black, 3 mm. long, not notched at tip, shape as figured; ædeagus greatly thickened and broadened just anterior to the lateral lobes, deeply grooved between the lobes; verga moderately broadened just posterior to the lateral lobes. Sternum black marked with clay color along the lateral and posterior margins of the sternites; last ventral segment constricted at the side with humeral angles rounded and a shallow apical notch at the center of the segment. The posterior third of the segment clay color. Valve black, narrowly margined with clay color, 3.25 mm. long, 2 mm. broad at widest point.

Allotype same as type: The last ventral segment has a double notch with the sides straight to the rounded humeral angles.

Holotype, male, No. 3906, allotype, female, No. 3907, C.A.S. Ent., and 37 paratypes have been examined. These were collected mainly in the hills of the East Bay district; thirteen males and three females near Berkeley, seven males near Rodeo, seven males and one female in Santa Cruz Mountains and about Mt. Hamilton, one male at Martinez, one male near Fairfield, one near Vacaville, Solano County, one in Tuolumne County, one in Los Angeles County on the ridge route about 18 miles north of Saugus, and two from Sespe Canyon, Ventura County.

The darker specimens of this species until recently have been confused with *O. canescens* Van D. and the paler forms with *O. napa* Davis. The darker forms agree with *O. canescens* generally in size of body and size and shape of wings and uncus but their more robust shiny black body, the white basal membrane of the wings, short broad valve, the broader thicker ædeagus and the coarse metallic song, disagree with the more slender pubescent body with orange venter, the brilliant orange basal membranes of the wings, the longer orange colored valve, the more slender ædeagus (Fig. 3) and the higher pitched song of *O. canescens*. The paler forms differ form the darker specimens by the clay-colored markings being more extended over

the body, varying from slightly paler prothorax, wings and venter to entirely clay-colored except the black tergum and spots about the front and knees (one specimen). *Okanagana napa* Davis has a more slender, pubescent, orange-marked body, narrower wings with brilliant orange basal membranes and a more slender valve and ædeagus.

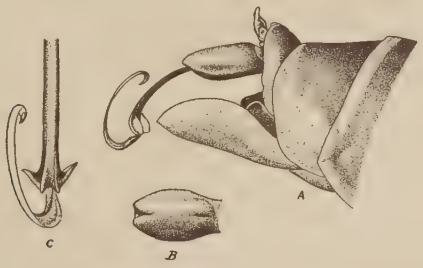

Fig. 1, Okanagana arboraria n. sp., male genitalia

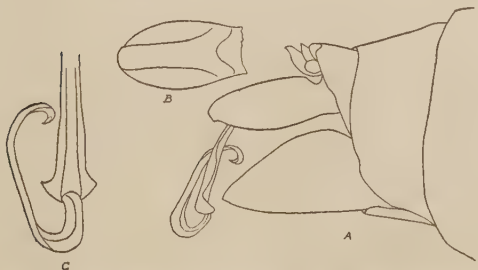

Fig. 2, Okanagana albibasalis n. sp., male genitalia

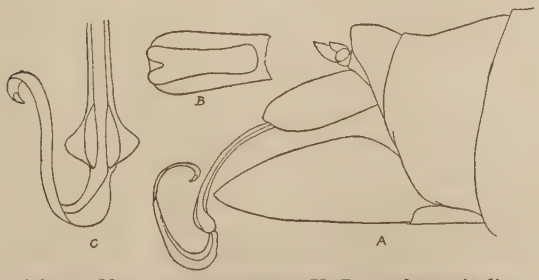

Fig. 3, Okanagana canescens V. D., male genitalia

A NEW PENTATOMID FROM TRINIDAD, W. I. (HEMIPTERA)

BY E. P. VAN DUZEE

1. Banasa bidens Van Duzee, n. sp.

Very close to *subrufescens* but with coarser and more uniform puncturation, longer rostrum, broader white margin to apex of scutellum and distinct genitalic characters. Length 8 mm.

Head nearly as long as its width at anterior angle of eye, coarsely, sparsely punctate, the edge slenderly dark. Pronotum as in *subrufescens*, coarsely punctate, sparsely before the humeri, more closely behind; latero-anterior margins rectilinear, the adjoining surface depressed. Scutellum coarsely punctate as in the allied species but with the apex more broadly smooth and whitish. Elytra as in *subrufescens* but with the outer apical angle more rounded. Antennal segments as 8:11:18:25:22. Rostrum attaining middle of second ventral segment. Propleuræ coarsely punctate, meso- and metapleuræ obscurely so; venter smooth, basal spine a mere tubercle. Basal plates of female genital segment as in *subrufescens*, deeply excavated, median plate narrow. Apex of male pygofer more deeply excavated than in *subrufescens*, the fundus truncate with a pair of approximate short blunt teeth; sides convex and heavily clothed with long pale hairs, the apical notch a right angle; styles curved, ligulate to near the broad truncated apex, its upper inner angle produced, subhastate.

Color ochraceous varied with olive green or castaneous on the corium; fusco-punctate, the apex of the scutellum becoming smooth and whitish; beneath pale, yellowish, incisures of connexivum with distinct black spots; apex of claws and of the rostrum black; tergum mostly dark castaneous; antennæ pale greenish or yellowish, apical half of V and most of IV infuscated; membrane hyaline, brown at base. Described from ten specimens in author's collection.

Holotype, male, No. 3887, and allotype, female, No. 3888, Calif. Acad. Sci. Ent., taken by Mr. H. D. Chipman, May 13 and 22, 1902, at Port au Prince, Trinidad, W. I.; paratypes six males same data, and one pair taken at Demerara, British Guiana, April 12, and May 7, 1901, by Mr. R. J. Crew.

This species has altogether the aspect of *subrufescens* but the male genital characters are very different; the two teeth of the pygofer also will distinguish this new species.

A NEW NAME AND OTHER MISCELLANEOUS NOTES

(Coleoptera)

BY H. C. FALL
Tyngsboro, Mass.

I have been kindly informed by Dr. M. H. Hatch of Washington State University that the specific name *temporale* used for a species of *Agathidium* in my recently published paper on this genus (Ent. Amer., XIV, 1934) is preoccupied by J. Sahlberg (1908) for a species from Anatolia. I wish therefore to propose **municeps n. n.** in its stead.

The present opportunity is taken to make known some more or less recent synonymy and a few other miscellaneous notes.

AMARA (CYRTONOTUS) AULICA Panz.

A specimen of this European species was taken by the writer at Louisburg, Nova Scotia, VIII-19-29. The identification is by Ing. Jedlicka through the kind offices of Dr. Walther Horn of Berlin. It is perhaps too soon to assume that the species has become established with us.

HYDROPORUS BRUMALIS, H. COMPERTUS, H. FALSIFICUS

These species, all recently described by Mr. W. J. Brown in the Canadian Entomologist, are for me no more than trifling variants of *planiusculus*, which in its western forms approaches uncomfortably close to the more northern representatives of *vilis*. Of *falsificus* and *compertus* I have seen authentic specimens. They are quite inseparable from examples in my *planiusculus* series, lying on the *vilis* side of the type but merging insensibly into the typical form. Of *brumalis* I have seen no authentic examples but a careful reading of the description offers nothing to convince me of its specific distinctness from *planiusculus*.

AGABUS PSEUDOCONFERTUS Wallis, and A. PALUSTRIS Wallis

These are respectively the same as *A. gelidus* Fall, and *A. kenaiensis* Fall. This synonymy has been known for some time to Mr. Wallis and myself and he may have published it, but if so I cannot locate it and the Leng Supplements did not get it.

PLATEROS COLUMBIENSIS Brown

This is *P. californicus* Van Dyke according to Mr. Hopping,

who writes that he had a specimen of *columbiensis* compared with Van Dyke's type.

HELMIS CRYOPHILUS Musgrave

This is *H. immunis* Fall; identity established by means of a paratype of *cryophilus* communicated by Mr. Musgrave.

HELMIS SOLUTUS Brown (*Can. Ent. 1933, p. 46*)

This is the maculate form of *H. concolor* Lec., specimens of which vary greatly in color from conspicuously marked with yellow to entirely black. There seem to be no accompanying structural variations.

LIMNIUS SUBARCTICUS Brown

A paratype from Mr. Brown proves this to be *L. tardellus* Fall.

AULONIUM BIDENTATUM Fab.

A series of specimens in my collection from Santa Rosa, Lower California, collected I think by Mr. G. Beyer, prove to be this species; comparison being made with an authentic example sent me by Mr. Arrow of the British Museum. The species must be added to our list.

MACROPOGON DUBIUS Brown, M. CRIBRICOLLIS Brown

The former is the male of *M. piceus* Lec., and the latter almost certainly the female of *M. testaceipennis* Mots. Mr. Brown was unaware of the fact (as also was Dr. Horn) that the differences in the lengths of joints 2-4 of the antennæ are sexual rather than specific; these joints being very short and equal in the male, and somewhat longer and unequal in the female. His differentiation of the species was therefore erroneous. The notion that *testaceipennis* and *piceus* are respectively male and female of one species has been broached in some quarters, but this cannot be true as I have both sexes of each.

LIMONIUS KNULLI Fall (*Can. Ent. 1933, p. 229*)

This is not distinct from *L. æger* Lec. I am indebted to Mr. Brown for suggesting this synonymy; the error is inexcusable.

LIMONIUS OVATUS Knull (*Ent. News, 1934, p. 9*)

This does not differ appreciably from *L. sinuifrons* Fall, as determined from a paratype sent by Mr. Knull for comparison.

Attention has not been called I think to the absurd association under one name of *Athous limbatus* Lec., *A. simplex* Lec., and *A. scissus* Lec. in the Leng list. This astonishing bit of synonymy seems to have originated with O. Schwarz in Genera Insectorum and is a fair sample of this author's unfamiliarity with our fauna. The three species are perfectly distinct as every American student of the Elateridæ knows.

AGRIOTES ARCANUS Brown (*Can. Ent. 1933, p.178*)

This is the species which we understand, and I think correctly so, to be the *isabellinus* of Melsheimer, although a recent search failed to reveal anything under this name in either the Melsheimer or the Le Conte collection. *Isabellinus* is a quite distinct species and not a variant of *oblongicollis* as now given in the List.

DRASTERIUS INCONGRUUS Fall (*Jour. N. Y. Ent. Soc., 1934, p. 12*)

On a recent visit of Mr. W. J. Brown of Ottawa he recognized my type of this species as the *D. debilis* of Le Conte, the type of which he had recently examined. It was difficult for me to accept this identification, but I have since verified it at Cambridge. Here I was misled by several inaccuracies in Le Conte's description of *debilis*, which states that the thorax is one-half longer than wide and with the hind angles sharply carinate. In my type of *incongruus* the thorax is scarcely measureably longer than wide and the hind angles are virtually non-carinate; the color too is quite different from that of the Le Conte description. Mr. Brown writes me that in a series of a dozen or so examples in their collection the color varies very greatly.

ACMÆODERA LINEIPICTA Fall

In the March number of Entomological News, 1934, p. 62, Dr. Van Dyke expresses the opinion that this species is "probably a synonym of *biedermanni* Skinner". As a matter of fact the two species have nothing to do with each other. Dr. Van Dyke writes me that his mistake was due to a misidentified

specimen purporting to be *lineipicta*. *A. nigrovittata* Van Dyke, described in the article above cited, is practically identical with *lineipicta* in size, color and markings, differing scarcely at all except in being of stouter more parallel form, which the Doctor assures me is constant throughout his series.

CRYPTOCEPHALUS APICIDENS Fall

This is not separable from *C. amatus* Hald.

ANTHONOMUS BACCHARIDIS Pierce

This is an *Epimechus* and seems to be identical with *arenicolor* Fall.

The following two Mexican species have been taken in Southern Arizona by Mr. H. K. Duncan and should be added to our List.

ACÆOCERA GIGAS L. & G. (Buprestidæ)

MONACHULUS (MONACHUS) SCAPHIDIOIDES Suffr. (Chrysomelidæ)

A NEW VARIETY OF CICADA

For the past several years the writer has been collecting an orange colored cicada in the vicinity of Fairfield, Solano County, California, which is similar in color to *Okanagana arboraria crocea* Wymore but agrees morphologically with *O. triangulata* for which the name ***O. triangulata crocina*** is now proposed.—F. H. Wymore.

A CHANGE OF NAME

My attention has been called to the fact that Col. Casey used the name *Buprestis contorta*.[1] Therefore my species described under the name *B. contortae*[2] will not hold, as the name is preoccupied, although now in the synonymy. I am therefore changing the name to ***Buprestis murrayanæ*** R. Hop.—Ralph Hopping.

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[1] April 28, 1899. Studies in the American Buprestidae, p. 95.
[2] 1933, April, Pan-Pac. Ent., Vol. IX, No. 2, p. 84.

NEW SPECIES OF NORTH AMERICAN WEEVILS IN THE FAMILY CURCULIONIDÆ, SUBFAMILY BRACHYRHININÆ

BY EDWIN C. VAN DYKE

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Tribe Ophryastini

Sapotes longipilis Van Dyke, new species

Elongate, fusiform, densely covered with gray scales, those of the rostrum, a lateral band on either side of prothorax and elytra and undersurface lighter in color, a pearly white or even faintly greenish, elytra in addition sprinkled with small patches of dark brown scales, the upper surface also sparsely clothed with rather long semierect setæ. Head convex above, front flattened and continuous with rostrum without evident transverse basal rostral impression, a few fine, deep, sparsely placed punctures on both front and rostrum, as well as a limited number of much inclined setæ, the rostral grooves finely impressed though with margins poorly defined because of the scales, and the eyes large, coarsely granular and much flattened. Prothorax evidently broader than long; base transverse; apex slightly arcuate; sides broadly rounded, somewhat constricted in front; disk rather deeply, moderately closely and coarsely punctured, though rarely approximately, with well defined though interrupted median longitudinal groove extending from base to beyond middle, and with a limited number of rather long, semierect setæ scattered over the surface. Elytra elliptical, the base extended forward like a collar and the apex pointed; striæ not defined but the serial punctures fine, regular, closely placed in front and much finer and more widely placed behind; intervals flat, each with a series of widely spaced, fine punctures, from which arise moderately long, white or brown, much inclined setæ. Beneath clothed with very large opalescent scales and a few widely spaced short setæ. Anterior tibiæ finely serrate along inner face, third tarsal segment distinctly wider than second and bilobed. Length 5.5 mm., breadth 2.5 mm.

Holotype (No. 3888, C. A. S. Ent.) and three paratypes, two from my collection and two from Dr. Blaisdell's collection, all collected at the same time by H. F. Wickham at Winslow, Ariz.

Colonel Casey was in error in stating, while defining the genus, that it had "non-fimbriate ocular lobes". In a fresh specimen of *puncticollis* Csy. from El Paso, Tex., the type locality, I find the ocular lobes with short but well developed fimbriæ. These

are also very evident in the four specimens of *longipilis*. To me the most distinctive feature of the genus is the arching of the lateral rostral sulci above, well marked in both species. *Sapotes longipilis* differs from the type species in its generally narrower and less robust form, the absence of a transverse depression at the base of the rostrum, in its long setæ, the finer rostral sulci and head punctures, the much finer and irregular pronotal punctures—coarse, deep and reticulate in *puncticollis*—, the much finer strial punctures of the elytra and in having both elytra and undersurface clothed with rather large and overlapping scales. My type specimen has the basal area of the third and fifth elytral intervals ornamented with white scales, present though less conspicuous in the paratypes.

Eupagoderes simulans Van Dyke, new species

Moderately elongate and somewhat robust, black, densely clothed with bluish gray scales intermixed with a few black, and arranged in a tessellated manner, except at the sides of the rostrum, in a median longitudinal and lateral band on each side of the pronotum where they are more generally black in color, and on the even numbered elytral intervals where they are somewhat fulvous. Head with front moderately convex with a shallow transverse impression at base of rostrum; rostrum rather short, very broad and thick and markedly arched at apex, the three sulci deep and extending to front. Prothorax about a fourth broader than long, sides shallowly arcuate, the disk with deep median groove and a few coarse, irregularly placed punctures, larger and closer at sides and finer on propleuræ. Elytra over three times as long as prothorax, elliptical, the males narrower than females as usual; striæ fine but generally well impressed and with somewhat coarse punctures, the intervals generally slightly convex, with the even ones somewhat narrower as a rule and darker in color and with the fine setæ more conspicuously displayed. Legs only moderately robust; apex of hind tibiæ obliquely rounded on outer side, not truncate; third tarsal segment but little broader than preceding even in males and with elliptical lobes; the terminal segments suddenly dilated beyond their necks giving them a bottle shape. Male length 11.5 mm., breadth 5.5 mm.; female, length 12 mm., breadth 6 mm.

Holotype male (No. 3889), and allotype female (No. 3890, C.A.S. Ent.) and numerous designated paratypes from a series of forty specimens in the collection of the California Academy of Sciences, all collected by J. O. Martin at Allamore, Tex., July

2, 1930. I have also seen many more from other localities in Texas.

This species like others in the genus is quite variable in size and somewhat unstable as to color pattern. I have selected as types specimens of intermediate size and of the most characteristic color pattern. Some specimens are of a more uniform gray with only the black striæ contrasting while others are a bit ocellate. It is evidently a common species in various parts of Texas and has no doubt been confused with *dunnianus* Csy. The latter is most certainly a synonym of *decipiens* Lec. I have typical *dunnianus* from El Paso, Tex., the type locality, which are in absolute agreement with Casey's description and which cannot be separated from specimens of *decipiens* checked with the LeConte type. The flattened surface of the front in *decipiens*, continuing in the same plane on to the rostrum without transverse basal impression, and the absence of the median rostral sulcus readily separates this species from *simulans*. The latter, however, closely simulates *geminatus* Horn, a species dwelling in a region fully a thousand miles distant from its own territory, both as regards general size and form as well as color pattern. *Simulans*, however, differs fundamentally from *geminatus* by having a rostrum that is decidedly more robust in every regard, broader, almost twice as thick, with the apex markedly depressed, the rostral sulci coarser and the eyes a bit more convex; prothorax less broad, more convex and more coarsely sculptured; elytral striæ generally deeper and the strial punctures coarser; legs decidedly less robust, the posterior tibiæ with the apex obliquely rounded, not truncate as in *geminatus* and *varius*; third tarsal segment in males but moderately dilated with the lobes elliptical, not broadly dilated and with lobes somewhat triangular; the terminal tarsal segments suddenly enlarged beyond neck or bottled shaped, not gradually enlarged as in *geminatus*.

Eupagoderes ocellatus Van Dyke, new species

Rather large, somewhat elongate and robust, black, densely clothed with small scales arranged in a tessellated manner, those of the entire under surface, legs and upper surface except as noted beyond of a pearly gray color; those of a narrow median longitudinal and of a broad stripe on each side of the pronotum black; those forming a broad, irregular and more or less inter-

rupted stripe along the course of the elytral striæ also black, while massed around the elytral strial punctures are golden brown scales, sometimes absent; in addition small arcuate setæ are to be found scattered over the surface. Head with front convex with a shallow transverse impression at the base of the rostrum; rostrum robust, broader in the female; rather abruptly depressed at the apex with median sulcus pronounced, the lateral less sharply defined. Prothorax about a fourth broader than long, sides broadly arcuate, anterior margin feebly arcuate and but little produced; disk with a shallow but distinct median groove, coarsely, deeply and irregularly punctured, more confluent at sides and finer and more distant on propleuræ. Elytra about three times the length of prothorax, oval; striæ fine, distinctly impressed, with somewhat coarse punctures, the intervals perceptibly convex and about equal breadth, the minute setæ hardly to be seen against the background of scales. Legs but moderately robust; apex of hind tibiæ truncate, with a broad oval area on outer side; third tarsal segment of middle and front legs rather broadly dilated and with elliptical lobes in the male, the terminal segments gradually dilated. Male, length 13 mm., breadth 5.5 mm.; female, length 14.5 mm., breadth 6 mm.

Holotype, female (No. 3891), allotype, male (No. 3892, C.A.S. Ent.), and one male and three female paratypes, collected by myself at Grand Junction, Colorado, June 12, 1926. I also have a depauperized female taken at the same time and a normal female from the California Academy collection, collected by J. R. Slevin at Thompson, Utah, June 1-5, 1913.

According to the Horn Key,[1] this species would follow *desertus*. By the Fall Key,[2] it would run close to *wickhami* with which it has no doubt been confused. From this last mentioned species, a practical paratype of which I have in my hands, *ocellatus* differs by being somewhat smaller, proportionally shorter and broader, with a variegated color pattern, *wickhami* being more or less of a unicolorous brown, with the scales moderate in size and arranged in a tessellated manner, not large and imbricated as in *wickhami*; it also differs by having the apex of the rostrum more suddenly depressed, the pronotum less produced apically, the disk more coarsely and irregularly punctured, the strial im-

[1] The Rhynchophora of North America by LeConte and Horn, Proc. Am. Phil. Soc., vol. 15 (1876), pp. 32-33.

[2] Miscellaneous Notes of North American Coleoptera, by H. C. Fall, Trans. Am. Ent. Soc., vol. 36 (1910), pp. 193-194.

pressions of the elytra weak and the strial punctures but moderately coarse, whereas the impressions in *wickhami* are deep sulci and the punctures are very coarse, the setæ also finer and less evident, and the third segment of the anterior tarsi not as wide in the males. The general facies of the two species is quite different. *Ocellatus* also resembles some of the larger specimens of *simulans* but can always be distinguished by having the apices of the hind tibiæ definitely truncate and the last tarsal segments gradually enlarged. The larger size, much longer afterbody, coarser pronotal punctures, less evident elytral setæ, and golden scales generally present around the elytral punctures will also assist in separating *ocellatus*. *Marmoratus* because of its size and maculate appearance might possibly be confused with *ocellatus* but it is readily separated by having no transverse impression at base of rostrum and the median rostral groove extending well onto the front; its elytral scales also overlap to a slight degree, many of its strial punctures are very coarse, and its posterior tibiæ are not truncated.

Eupagoderes setosus Van Dyke, new species

Small, moderately elongate, densely clothed with rather large opalescent scales having a pronounced rosy hue and with here and there irregular patches of brown scales, those of the afterbody imbricated or overlapping more or less, the elytra also with numerous, rather long, white, semierect setæ. Head with front convex; a rather deep transverse impression at base of rostrum, the latter robust, gradually arcuate to apex, the median sulcus linear but vague, the lateral linear, also poorly defined, and the setæ conspicuous especially on rostrum, though not as long as on elytra. Prothorax subglobular, slightly broader than long, apex moderately produced forwards, the sides broadly arcuate and constricted toward apex; disk very convex, with a shallow but linear median impression and a few minute, very irregularly placed punctures, each bearing a fine seta. Elytra elliptical, about two and a half times the length of the prothorax; striæ finely impressed and with fine, rather closely placed, elongate punctures; intervals flat, of equal breadth and with rather long irregularly biseriately arranged setæ. Legs moderately robust, the apices of hind tibiæ outwardly, obliquely narrowed, not truncate; third tarsal segment on all legs broadly and suddenly dilated and lobed, the terminal segments somewhat abruptly dilated beyond the shank. Length 7mm., breadth 2.75 mm.

Holotype, male, (No. 3893, C.A.S. Ent.) and paratype male, received from Charles Liebeck, the specimens bearing the locality label, Phoenix, Ariz.

This species may be recognized by its small size, the vague median rostral groove, the subglobular prothorax with the very convex, practically impunctate pronotum and the very conspicuous setiferous vestiture. In Fall's Key, it would run close to *mortivallis* Fall. It is, however, a very distinct species standing well apart from other members of the genus.

Eupagoderes huachucæ Van Dyke, new species

Medium sized, robust, densely clothed with black, brown and white scales arranged in a tessellated manner; head and sides of prothorax dominantly white; brown scales of pronotal disk more or less concentrated into two broad stripes, one on either side of the middle; disk of elytra clouded but mainly brown, the legs barred. Head with front feebly convex with a vague transverse impression at base of rostrum; rostrum very robust, distinctly trisulcate and evenly arcuate at apex. Prothorax almost a fourth broader than long, apex barely arched forwards, the base two-sevenths broader than apex, sides moderately arcuate, feebly sinuate near both apex and base, widest in front of middle; disk with a vague linear longitudinal impression at middle, chiefly defined by a series of fine punctures, and with a few, small punctures irregularly scattered over the surface. Elytra cordiform, broad at base with prominent humeral region; disk evenly convex with striæ clearly defined near base and apex only, elsewhere indicated by the rows of fine, well spaced punctures. Legs very robust, apices of hind tibiæ distinctly truncated on outer side, the third tarsal segment moderately enlarged and lobed and the terminal segment gradually enlarged outwardly. Length 13 mm. (with head extended), breadth 5 mm.

Holotype (No. 3894, C.A.S. Ent.), a unique, probably a female, collected by E. P. Van Duzee along the Babocomari River, Huachuca Mountains, Ariz., Aug. 8, 1924.

This species appears to me as more generalized and distinct than any of the previously described species. It has somewhat the appearance of *mexicanus* Sharp as indicated by the figure in the "Biologia Centrali-Americana" but differs from that by the dense scaly vestiture and by both pronotum and elytra having the punctures fine and sparse. Its generally even surface and the shape of the elytra also readily separates it from any species in our own fauna.

Eupagoderes halli Van Dyke, new species

Moderate in size, trimly built, densely clothed with rather large scales of a black, light brown or chalky white color which are arranged in a tessellated manner, the white scales dominating and almost entirely covering the sides and under-surface of the body, the brown forming an irregular sutural vitta, small irregular patches here and there on the elytra, chiefly posteriorly, and, in company with the black, two broad stripes on the pronotum, one on either side of the middle, while the black also form irregular patches which are scattered over the upper surface of the elytra. Head with front flat, on the same plane as the upper surface of the rostrum, the transverse impression at the base of the rostrum practically obsolete; median rostral groove linear and of normal length, the lateral also linear but short; rostrum depressed at apex and of but moderate robustness. Prothorax about a fifth broader than long, base almost a fifth wider than apex, the latter feebly arcuate; sides moderately rounded, sinuate and constricted towards base, feebly narrowed near apex; disk moderately convex and with small, deep punctures widely and irregularly scattered over the surface. Elytra cordiform; humeral area prominent, narrowed apically, the disk convex, rather evenly arcuate from base to apex; striæ fine, irregular and generally complete only at sides, the strial punctures fine and widely spaced, a few minute hooked setæ also observable, chiefly apically. Legs only moderately robust, apices of hind tibiæ distinctly truncate on outer side; third tarsal segment hardly wider than second; the terminal segments gradually enlarged. Length 9 mm., breadth 3.75 mm.

Holotype (No. 3895, C.A.S. Ent.), and four paratypes collected by H. N. Hultgren of the Ansel Hall Expedition of 1933 into northern Arizona and southern Utah. The first was found 19 miles S.W. of Kayenta, Navajo Co., Ariz., alt. 6500 ft., June 20, 1933, and the paratypes 23 miles west of Kayenta, alt. 6900 ft., June 23, 1933.

This species looks much like a smaller specimen of *huachucæ* and is no doubt very closely related to it. Its distinctive features are the more definite type of maculation, the flattened head and obsolete transverse post-rostral impression, the linear rostral grooves and, with *huachucæ*, the generally even upper surface, cordate body, prominent humeral region, fine striæ and distinctly tessellated arrangement of scales.

Tribe Tropiphorini

This tribe as constituted by Pierce,[3] undoubtedly belongs close to the Oprastini though it is a much less definite unit. The bulk of the species are to be found in western North America and most of them no doubt originated from stock having its origin in the great Northwest. There are many mistakes in the make up of the tribe as given in the Leng Catalogue. The following may be noted. *Cimbocera conspersa* Fall is not a variety of *pauper* Horn as stated by Pierce. It is a very distinct species as shown by the very broad rostrum, much narrower in *pauper*, as well as by other characters. *Cimbocera sericea* Pierce is but a weak race of *conspersa*. *Dichoxenus* should include not only *setiger* Horn but *Anametis setosus* Blatch. *Amotus* Csy. will have to be removed from the tribe and placed in the *Epicærini* with *Stamoderes* Csy., of which it is no doubt synonymous. The genus *Mimetes* Sch. as interpreted by Horn is probably the correct generic name for the genus which should supercede both. We will try to settle that by having comparisons made with the type. *Melbonus* Csy. will have to be dropped as the type species *scapalis* Csy. is a true *Epicærus* and very close to several species from southern Mexico. *M. denticulatus* Pierce is also an absolute synonym of *scapalis* Csy. as shown by a careful comparison made by Buchanan and myself. *Melamorphus* Horn has already been suppressed by me,[4] the included species being placed in *Dyslobus* Lec. The following new genera and species will have to be added to the tribe.

Genus Pseudorimus Van Dyke, new genus

Body densely scaly with head, prothorax and elytral declivity sparsely pilose; rostrum shorter than head, barely narrower at base than front between the eyes, subquadrangular, a transverse impression at base separating it from front, tip feebly emarginate and with nasal plate distinct and depressed but not sharply delimited; supports of mandibular deciduous pieces not prominent; scrobes deep, well defined, lateral, arcuate and passing rapidly inferior in front of eyes; antennæ rather long; scape long, rather suddenly clavate, sparsely pubescent, not squamose, reaching

[3] Miscellaneous contributions to the knowledge of the Weevils of the Families Attelabidæ and Brachyrhinidæ, by W. Dwight Pierce, Proc. U. S. Nat. Mus., No. 1988, vol. 45 (1913), p. 377.

[4] A short Review of Dyslobus LeConte, A genus of Broad-nosed Weevils of the Sub-family Otiohynchinæ with Descriptions of New Species, by Edwin C. Van Dyke, Pan-Pacific Ent., vol. IX (1) (1933), pp. 31-47.

posterior margin of eye; funicle seven-segmented, segments 1—2 each about three times as long as broad, 3—7 shorter and subclavate, seventh free, club oval, acute. Prothorax transverse, truncate at base, feebly emarginate at apex, sides distinctly arcuate, postocular lobes very feebly yet distinctly fimbriate. Scutellum short, transverse. Elytra elongate, oval, humeral area oblique, not angled, gradually attenuate posteriorly. Metasternum short, sides pieces indistinct, metaepisternal suture obliterated, intercoxal process feebly arcuate in front; second abdominal segment longer than the following two united, separated from the first by a broad and feebly arcuate suture. Femora subpedunculate; anterior and middle tibiæ mucronate at tip, the former denticulate within; hind tibiæ with corbels open; tarsi with third segment broad and bilobed and all densely pubescent beneath.

Genotype: *Pseudorinus granicollis*, new species,

This genus belongs near *Orimoderma* Lec. The general facies of the species is quite similar, particularly as regards the conspicuous scaly vestiture and general elongate form. They also dwell in the same zoo-geographical region and I believe originated from the same stock. The genus, however, has several markedly divergent features which seem to warrant its independent status. The most distinctive characters are that the scape of the antennæ is much longer, the funicular segments also longer, the post ocular lobes of the prothorax but poorly developed while prominent in *Orimoderma*, and the second abdominal segment separated from the first by a shallow and broadly arcuate suture, strongly arcuate and limited to the middle portion in the other. The front of the head in *Pseudorimus* is also flatter, the prothorax more transverse and with more strongly rounded sides, the scape pilose, not squamose as in *Orimoderma*, the tibiæ pilose above as well as squamose, and the head and apical declivity of the elytra ornamented with a limited amount of fine pile whereas the entire upper surface except the apex of the rostrum in *Orimoderma* is bare of pile though densely squamose.

Pseudorimus granicollis Van Dyke, new species

Elongate, narrow, black with appendages dark rufo-piceous, clothed with scales mostly of the body color though with scattered patches of a pearly color; scales of the head and prothorax somewhat dispersed, those of the elytra densely placed in a mosaic

manner while those of the underside of the afterbody and legs are somewhat sparse; rostrum, front, elytral declivity and undersurface also somewhat pilose, long about the mouth, short elsewhere. Head longer than prothorax; front flattened with a deep transverse impression at base of rostrum; the latter somewhat narrower than interocular space, quadrate, arcuate; upper surface of front and rostrum rather, finely, deeply, and somewhat closely and cribrately punctured; eyes quite prominent, projecting well beyond side margin of head. Prothorax at least a fifth broader than long; the front margin distinctly emarginate at middle; base margined at sides; sides somewhat straight and diverging from the constriction to beyond the middle, then arcuate and narrowed forwards with a slight constriction near front margin; disk moderately flattened with a faint median longitudinal ridge and finely, deeply, rather closely punctured, the punctures somewhat strigose and arranged in a more or less concentric manner, the intervening area also quite granular in appearance. Elytra two and two-thirds times length of prothorax, elongate oval, apex obliquely declivous; disk convex though a bit flattened at middle, the striæ distinct, finely impressed, with well marked, rather closely placed punctures; intervals broad and flat, the apical declivity sparsely, finely pilose. Undersurface more or less finely punctured though these are somewhat concealed by the scales. Length 13 mm., breadth 4.5 mm.

Holotype (No. 3896, C.A.S. Ent.), a unique specimen in my collection from Bearfoot Park,, Chiricahua Mts. Ariz., 8000-9000 ft. alt., collected July 15, 1927, by J. A. Kusche. The specimen is slightly injured, perhaps old. There is, therefore, a possibility that fresh specimens might have the forebody better clothed with scales. This species superficially resembles *Orimoderma protracta* Horn, which has also been collected in the same region, but can be easily separated because of its larger size, greater breadth, more prominent eyes, broader and granular pronotum, as well as by the distinctive generic characters.

Pseudorimus orbicollis Van Dyke, new species

Elongate, moderately narrow, rufo-piceous, appendages rufous; more or less densely clothed with bright opalescent scales throughout, which are arranged in a mosaic manner; head, pronotum and apical portion of elytra also sparsely pilose. Head nearly a third longer than prothorax, front flattened and, to a certain degree, continuous on the same plane as the upper surface of the rostrum, the transverse impression at the base of the rostrum being feeble; rostrum somewhat narrower than interocular area, quadrate, slightly arcuate in front; head and rostrum finely, deeply and

sparsely punctured, the punctures in most cases concealed by the scales; eyes large though much flattened as in *Orimoderma protracta* Horn; antennæ as described in generic description. Prothorax slightly more than a sixth broader than long; base transverse and finely margined at sides; apex feebly emarginate at middle; sides broadly, rather evenly arcuate from base almost to apex where vaguely constricted; disk quite smooth though punctured like the head. Elytra about three times the length of the prothorax and a third longer than broad; disk rather evenly convex, the striæ distinct though finely impressed with small, rather closely placed, deep punctures; intervals broad and flat. Undersurface finely, sparsely punctured, the punctures generally concealed by the scales, and very finely, sparsely pilose. Length 10 mm., breadth 4 mm.

Holotype (No. 3897, C.A.S. Ent.), collected by myself in the Santa Fé Canon, Santa Fé, N. Mex., July 23, 1926. A second but imperfect specimen is also in the California Academy of Sciences' collection, collected on Gallena Cr., Jemez Mts., N. Mex., at an altitude of 8500 ft., by J. Chamberlin, July 24, 1930.

This species is somewhat different in appearance from the preceding and superficially much more like *Orimoderma protracta* Horn, in fact probably confused with the same for both are to be found in the same region. Aside from the generic characters, it may be told from this by its flatter head and rostrum, more orbicular prothorax, broader, more cordate afterbody, more defined elytral striæ and fine punctures on head, pronotum and elytral declivity. From *Pseudorimus gravicollis*, it differs chiefly by its smaller size, less prominent eyes and non-granular pronotum.

Genus Crocidema Van Dyke, new genus

Body more or less densely clothed with scales as well as uniformly pilose; head with front somewhat flattened; rostrum at middle narrower than interocular area, subquadrate, separated from front by a more or less definite transverse impression, tip emarginate and with nasal plate fairly well defined; supports of deciduous pieces of mandibles not prominent; scrobes, deep, generally short, well defined, and passing rapidly inferior in front of eyes; antennæ rather long, scape quite suddenly clavate, sparsely pubescent, not squamose, and about reaching posterior margin of eye; funicle seven-segmented, segments 1—2 each about three times as long as broad, 3—7 shorter and subclavate, seventh free, club fusiform; eyes large though generally much flattened. Prothorax

transverse, truncate at base and apex; sides arcuate, post ocular lobes feebly developed though distinctly fimbriate. Scutellum distinct, short, and transverse. Elytra elliptical, humeral area oblique, not angled, apex pointed. Metasternum short, side pieces indistinct, suture obliterated; intercoxal process feebly arcuate in front; second abdominal segment a bit longer at middle than the following two segments united and separated from the first by a suture distinctly arcuated at middle. Femora subpedunculate; anterior and middle tibiæ mucronate at tip; femora at most obscurely denticulate within; hind tibiæ non-truncate at apex and with corbels open; tarsi with third segment broad, bilobed and densely pubescent beneath.

Genotype: *Crocidema californica*, n. sp.

This genus resembles both *Orimoderma* and *Pseudorimus* and with them forms a definite complex within the tribe. It differs from both superficially by being uniformly pilose as well as squamose. From *Orimoderma*, it diverges by having feeble post ocular lobes, prominent in *Orimoderma*, by having the scape longer, reaching to posterior margin of eye, only to anterior margin in the other, the prothorax transverse not subcylindrical, and the scrobes longer and more distinctly arcuate as a rule, than in *Orimoderma*. From *Pseudorimus*, it differs principally, aside from its general piloseness, by having the postocular lobes slightly better defined and the suture between the first and second ventral sclerites more distinctly and narrowly arcuate. It also somewhat resembles *Peritaxia* but this latter has the humeri rectangular and the mandibular supports of the deciduous parts prominent as well as possessing other divergent characters. As far as I can judge by the material at hand the genus is restricted to the southern part of the Great Basin and the mountains adjacent.

Key to Species

1. Rostrum very robust, almost as broad at base as at apex, transverse impression quite evident; post ocular lobes distinct; elytral striæ finely, sharply impressed. San Bernardino Mts., Calif. ..... *californica* n. sp.
—. Rostrum distinctly narrower at base than apex 2
2. Median funicular segments almost twice as long as wide. Northern Ariz. ..... *nigrior* n. sp.
—. Median funicular segments but little longer than wide 3
3. Transverse impression at base of rostrum very feeble, the flattened front on practically the same plane with upper sur-

face of rostrum; postocular lobes feeble but evident.....
.....*planifrons* n. sp.
—. Transverse impression at base of rostrum deep, upper surface of rostrum arcuate, post ocular lobes very feeble.....4
4. Rostrum much longer than broad, scaly vestiture black, pile of a double type and rather fine. Southern Utah.....
.....*attenuata* n. sp.
—. Rostrum almost as broad as long, scaly vestiture to a great extent pearly white; pile of a single type, short, semierect, scattered setæ.....*albovestita* n. sp.

Crocidema californica Van Dyke, new species

Elongate, narrowed in front and behind; black with antennæ, tibiæ and tarsi somewhat rufous; densely clothed with scales that are dark but have an irridescent or pearly lustre and are arranged in a tessellated manner; head distinctly setiferous; pronotum provided with short upright hair; elytra clothed with sparse, elongate, somewhat inclined hair, the rest of the body also quite pubescent. Head longer than prothorax; front somewhat flattened, a distinct transverse impression at base of rostrum; rostrum fully 2 mm. long, as wide at base as interocular space and but slightly wider apically, the alæ being but little expanded, feebly, broadly, longitudinally sulcate at middle and depressed at apex, a small fovea between the eyes with a smooth line continuing forward from it; scrobe short, broadly opened behind and arcuate; scape reaching posterior margin of eye; funicular segments 1—2 each three times as long as broad, segments 3—7 clavate and twice as long as broad; eyes large, subangular below, and much flattened. Prothorax about a sixth broader than long, base and apex truncate, sides evenly but moderately rounded from base to just before apex where slightly constricted; disk convex, finely and sparsely punctured, the punctures generally concealed by scales. Elytra elliptical, about two and a half times as long as prothorax; less than twice as wide as long in female and about twice as wide in males with apical declivity abruptly rounded, the striæ finely, sharply impressed in females, broader and deeper in males and with distinct, rather closely placed punctures; intervals rather broad and flat in females, narrower and a bit convex in males; clothed throughout with both scales and hair, the latter sparse, both long and short and somewhat obliquely inclined. Undersurface finely, sparsely punctured, squamose and finely pilose, the last ventral segment with a deep circular impression in the female and a broader and flatter impression in the male. Female, length 11 m.., breadth 4 mm.; male, length 10 mm., breadth 3.25 mm.

Holotype, female (No. 3898), allotype, male (No. 3899, C.A.S. Ent.), and three paratypes. The first was collected by myself

at Idlewild, Mt. San Jacinto, Cal., July 2, 1928; the second on Mt. San Jacinto, Cal., July, 1912, by J. C. Bridwell; the others at Forest Home, San Bernardino Mts., June 13, 1928, by myself, the San Bernardino Mts. in Aug., and on Mt. San Jacinto, about 9000 ft., July 19, 1912, by J. C. Bridwell. Numerous other specimens have been seen. This is a species that has been well known to me for many years. It appears to be restricted to the San Bernardino range of mountains of southern California. In many old collections it has been mixed with *Orimoderma protracta* Horn.

Crocidema nigrior Van Dyke, new species

Elongate, narrowed in front and behind, black, densely squamose and pubescent, the scales generally of the body color though here and there as on the legs and undersurface of an opalescent hue; hair of the head long, of the pronotum sparse, rather short and erect and of the elytra mixed long and short and suberect. Head longer than prothorax, front somewhat flattened, transverse impression at base of rostrum shallow but quite evident; rostrum less than 2 mm. long, somewhat narrower at base than apex, feebly, broadly sulcate at middle and arcuately depressed at apex, a small fovea between the eyes and a fine line continuing forward from it; scrobe short, arcuate and wide behind; funicular segments 3—7 clavate and fully twice as long as wide; eyes large, flattened and slightly angulated below. Prothorax a sixth wider than long, base and apex truncate, sides broadly rounded, somewhat narrowed forward and feebly constricted before apex; disk convex, surface granular because of scales, finely, sparsely punctured and sparsely pilose. Elytra elliptical, less than two and a half times as long as prothorax and slightly more than a third longer than broad; disk somewhat flattened, abruptly arcuate at elytral declivity; striæ shallow but not sharply impressed and with somewhat coarse, rather close punctures; intervals slightly convex; general surface squamose and pilose, the pile consisting of sparse longer hair mixed with more numerous shorter hair. Undersurface as in *californica*. Length 10 mm., breadth 4 mm.

Holotype female (No. 3900, C.A.S. Ent.), and two paratype females from a set of six specimens, all collected by myself on the south wall of the Grand Canon, Ariz., near El Tovar, July 27, 1926. The three specimens not included as types are somewhat smaller than the type set but otherwise the same. Two other specimens in the Academy collection have also been seen. These were collected by H. N. Hultgren on the Ansel F. Hall Ex-

pedition of 1933, to northern Arizona and southern Utah, one specimen found at Rainbow Lodge, Navajo Mt., Coconino Co., Ariz., alt. 6500 ft., July 14, 1933, the other 15 miles W.N.W. of Kayenta, Navajo Co., Ariz., alt. 7200 ft., June 24, 1933. These specimens are exactly like those collected by myself.

This species is closely related to *californica* but is somewhat smaller, proportionately shorter, with the rostrum narrower and generally less robust, the prothorax narrower, the elytra more evenly arcuate at sides, the elytral declivity more abrupt, the strial punctures coarser, the body darker and the pile denser.

Crocidema planifrons Van Dyke, new species

Elongate, narrowed in front and behind, dark rufo-piceous, densely clothed with rather large bronzed scales and pubescence; hair of head and pronotum moderately long and much inclined, that of the elytra long, light fulvous and semierect. Head about a third longer than prothorax; front much flattened; transverse impression at base of rostrum quite feeble, the front and upper surface of rostrum as a result about on the same plane; rostrum 1.5 mm. long, narrower at base than at the depressed apex, a feeble fovea between the eyes; scrobe short, arcuate and wide behind; funicular segments 3—6 obcordate and each less than twice as long as wide; eyes large, slightly convex and oval in outline. Prothorax a fifth wider than long, base truncate, apex feebly emarginate, sides well rounded at middle, somewhat oblique, straight and convergent towards base and apex; disk a little flattened and sparsely, finely punctured. Elytra elliptical, almost three times as long as prothorax and considerably less than twice as long as broad; disk convex, a bit flattened forwards, evenly arcuate from middle to apex; striæ fine, distinctly impressed and finely, closely punctured, the intervals feebly convex apically, the pile more or less uniform in length. Undersurface as in preceding species. Length 9 mm., breadth 3.5 mm.

Holotype (No. 3901, C.A.S. Ent.), and paratype in my collection, collected in the Chiricahua Mts., Cochise Co., Ariz., Mch. 11, 1917, by Virgil W. Owen. There is also a third specimen in the Blaisdell collection, bearing the label, Ariz., April 14, 1916.

This species may be recognized by its moderate size, narrow form, the light bronze scaly vestiture with scales of fair size, the single type of pilosity, short median funicular segments and by the flattened head and short rostrum, distinctly shorter than in either of the preceding species.

Crocidema attenuata Van Dyke, new species

Elongate very much narrowed especially anteriorly and posteriorly, black, densely clothed with scales of moderate size and of body color, and conspicuously pilose; hair of the elytra longer and of a double type, a few scattered, very long, erect hairs, arising from amongst the more numerous shorter, white, somewhat inclined ones. Head longer than prothorax, front slightly convex, transverse impression at base of rostrum pronounced; rostrum 1.75 mm. long, its base subcylindrical and much narrower than apex, gradually arcuate from basal impression to apex, a deep interocular fovea, the post ocular lobes quite feeble; scrobe well defined, but little widened behind, somewhat long and only slightly arched, funicular segments 3—6 obcordate and each less than twice as long as wide; eyes fairly large, feebly convex, broadly oval. Prothorax a fifth wider than long, broadest in front of middle, base and apex truncate, sides slightly rounded; disk convex and finely, sparsely punctured. Elytra elongate elliptical, pointed behind, three times the length of the prothorax and considerably less than twice as long as wide; disk convex, arcuate towards apex but declivity rather abrupt; striæ fine, moderately coarsely, closely punctured, the intervals flat, the odd ones perceptibly narrower than the even. Undersurface as in preceding species. Length 9.5 mm., breadth 3.25 mm.

Holotype (No. 3902, C.A.S. Ent.), a unique in the collection of Dr. F. E. Blaisdell, collected at Zion National Park, Utah, May 17, 1922, by Vasco M. Tanner.

The distinctive features of this species are its narrowness, deep transverse impression at base of rostrum, somewhat narrow, subcylindrical rostrum, evenly arcuate upper surface of basal area, rather long and less arched scrobes, and very feeble post ocular lobes. It simulates *nigrior* in color and double type of elytral pile, and *planifrons* in type of antennæ. It might possibly be taken for the male of *nigrior* but the distinctive type of rostrum, antennæ, and scrobes as well as much reduced post ocular lobes should prevent that.

Crocidema albovestita Van Dyke, new species

Narrow, elongate, black, densely clothed with rather large scales which are in the main of a pearly white color, arranged in a tessellated manner, and with rather short, semierect setæ sparsely scattered over the body, except on the front of head where they are denser and longer. Head slightly longer than prothorax, front somewhat convex, transverse impression at base

of rostrum well marked; rostrum broad, barely longer than broad, somewhat narrower at base than apex and than front, and arcuate from basal impression to apex, scrobes well defined, short, widely opened behind; funicular segments 3—6 transverse; eyes moderately large, elliptical and feebly convex. Prothorax about a fifth wider than long, base truncate, apex feebly arcuate, sides well rounded, faintly contricted near apex, post ocular lobes distinct though feeble, the disk convex and with setæ more inclined than on elytra. Elytra fusiform, two and a half times length of prothorax and about twice as long as broad; disk convex, somewhat flattened from scutellum to apex of declivity, thence evenly rounded to straight and oblique declivity. Striæ fine, rather finely, not closely punctured, intervals flat and, except for the narrow sutural, about equal in breadth. Undersurface similar to preceding. Length 8 mm., breadth 2.75 mm.

Holotype (No. 3911, C.A.S. Ent.), a unique collected by H. N. Hultgren on the Ansel F. Hall Expedition of 1933, to northern Arizona and southern Utah. It was taken 19 miles S. W. of Kayenta, Navajo Co., Ariz., alt. 6500 ft.

This, the smallest species of the genus, is readily separated from its fellows by its light color, sparse, short setæ and other characters mentioned in the key.

AN INTERESTING NEW FULGORID (HEMIPTERA)

BY E. P. VAN DUZEE

Loxophora dammersi Van Duzee, n. sp.

Allied to *transversa* V.D. from Utah but at once distinguishable by the large polished black callous on the base of the vertex. Pale greenish, transversely banded with fuscous and white. Length, 4 mm.

Head a little longer than in *transversa*; vertex narrower, its base largely occupied by a large round polished black callous resting on its base; front nearly parallel, 5-carinate, the median and intermediate carinæ connivent at apex of head in a polished area that sends a single carina on to the apex of the vertex; frontal fovæ deep, the lateral carrying two rows of pustules which become three on their superior aspect next the vertex; hind margin of pronotum nearly straight; propleural callous very large and conspicuous. Elytra scarcely reaching to middle of tergum, its vena-

tion less distinct than in the allied species. Anterior and intermediate femora foliaceous, as broad as the front, their tibiæ flattened, the anterior slightly expanded. Lateral compartments of front, pronotum, sides of propleuræ, lateral angles of scutellum and sides of abdomen pustulate.

Color greenish white, tinged with yellow on scutellum and tergum; dorsum crossed by a broad brown band covering anterior one-half of the elytra nearly to base; tergum with deeper brown basal and subterminal bands; legs varied with brown; basal callous and four points on vertex, two points next the eyes, the large propleural callous, cheeks between the eyes and antennæ and a broken band across the front connecting these areas, deep black; apex of clypeus, two basal and two smaller apical spots on the labrum brown; coxæ, legs and pleural pieces varied with brown; hind tibiæ with six or seven black spines.

Holotype, female, No. 3894, Calif. Acad. Sci. Ent., and seven female paratypes, taken by Commander C. M. Dammers on the east slope of the San Jacinto Mountains, California, along the "Pines to Palms" highway, six on October 10th, the others about two weeks earlier. All were taken from Agave which may quite likely be their food plant. That six only were taken in a full day's hunt, and those all females, would indicate that their season was earlier, when males probably would have been found with the females. It is perhaps a rare species and local in its distribution. It gives me pleasure to dedicate this, one of the most beautiful of our little Fulgorids, to its discoverer, who is doing most valuable work in the rearing of our Californina Lepidoptera.

Dr. Ball has recently sunk my *transversa* as a synonym of *Ticida cingulata* Uhler but it is quite distinct. The genus *Loxophora* may, I think, also stand, on account of the foliaceous anterior femora which are found in both *transversa* and *dammersi* but not in *Ticida*.

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